REMARKS

Claims 1-8 are now present in the application. Claims 1 and 5 have been amended and claims 6-8 have been added. Claims 1 and 5 are independent. Reconsideration of this application, as amended, is respectfully requested.

Status of the Drawings

In the Examiner's Office Action, the Examiner has not provided any indication as to the status of the drawings. As the Examiner will note, the present application was filed with five (5) sheets of formal drawings, as indicated on the transmittal dated December 29, 2000. It is respectfully requested that the Examiner provide an indication as to the status of the drawings in the next Office Communication so that Applicants can make any necessary drawing corrections in a timely manner.

Objection to the Specification

The Specification stands objected to, since the Abstract of the Disclosure is not a single paragraph. By the present Amendment, the Abstract of the Disclosure has been amended to be in proper form. Accordingly, the Specification objection has been obviated.

Rejection Under 35 U.S.C. § 103

Claims 1-5 stand rejected under 35 U.S.C. § 103 as being unpatentable over the Applicant's Admitted Prior Art (AAPA) in view of Shin, U.S. Patent No. 6,307,531. This rejection is respectfully traversed.

At the outset, it is requested that the Examiner clarify the present rejection. Specifically, the Examiner relies on the AAPA and the Shin reference in the statement of the rejection; however, the body of the rejection also relies on the Kim reference. Since the Shin reference does not appear to teach providing floating or dummy channels, it is believed that the Examiner's statement of rejection should include the Kim reference; however, clarification is requested.

The present invention is directed to a liquid crystal display device, wherein independent claim 1 is directed to a quad type liquid crystal display device and independent claim 5 is directed to a liquid crystal display panel. Independent claim 1 requires a combination of elements including "a plurality of data drive integrated circuits having 'm' (m is a natural number) number of channels, wherein (3n-1)th (n is a natural number) channels for each data drive integrated circuit are floating." Independent claim 5 requires a combination of elements including "a plurality of drive integrated circuits for driving the panel, each of said plurality of drive integrated circuits having 'm' (m is a natural number) number of channels and 'n' (n is a natural number) number of floating channels" and "wherein n<m." Applicants respectfully submit that the references relied on by the Examiner are insufficient to teach or suggest the present invention as required by independent claims 1 and 5.

The Examiner relies on Figure 5 of the present invention as statutory prior art. First of all, Applicants have not admitted that Figure 5 of the present invention is statutory prior art, since the present specification only refers to this subject matter as "Related Art." Since Applicants do not believe that the Examiner's rejection is proper in view of the combination of the AAPA and the Shin reference, whether the subject matter in the specification is statutory prior art or not does not need to be decided at this time. However, if the Examiner persists in his

rejection of the claims of the present invention, it is respectfully requested that the Examiner provide evidence that the "Related Art" in the present specification is statutory prior art to the present invention. In addition, Applicants reserve the right to comment on whether the "Related Art" in the specification is statutory prior art to the present invention. The main reason for this is that the Examiner relies on this subject matter for a rejection under 35 U.S.C. § 103. If the subject matter is only available under 35 U.S.C. § 102(e), (f) or (g), and the subject matter was owned by Applicants at the time of the present invention, it would not be proper for the Examiner to rely on this subject matter in a rejection under 35 U.S.C. § 103(a) (see 35 U.S.C. § 103(c)).

To the extent Figures 1-5 of the present specification are statutory prior art to the present invention, Applicants respectfully submit that the Examiner's rejection is improper and should be withdrawn. First of all, referring to the Shin reference, this reference is not directed to a quad type liquid crystal display device as in the present invention and the "Related Art" Figures 1-5. Referring to Figure 4 of Shin, multiple data integrated circuits 32 are illustrated; however, no gate integrated circuits are included. In view of this, Applicants respectfully submit that the Shin reference is non-analogous to the present invention. Specifically, one having ordinary skill in the art would not look to a non-quad type liquid crystal display device in order to solve a problem in a quad type liquid crystal display device. In view of this, Applicants respectfully submit that the Examiner's rejection is improper and should be withdrawn.

In addition, referring to the Examiner's Office Action, the Examiner relies on the AAPA as disclosing all of the elements of the present invention except for the fact that the AAPA does not use four data drive integrated circuits. As mentioned above, the Shin reference is not

direction to a quad type liquid crystal display device. Therefore, the fact that more than three data drive integrated circuits are provided in the Shin device is irrelevant to the quad type liquid crystal display device of the AAPA. In addition, Applicants respectfully submit that the AAPA also fails to disclose other aspects of the presently claimed invention. Referring to Figure 5 and page 5, lines 4-5 of the present specification, it is stated that "each of the outermost data drive ICs 115c and 115d has 64 number of dummy channels." In view of this, only two of the data drive integrated circuits in the AAPA have floating (dummy) channels. In the presently claimed invention; however, each of the data drive integrated circuits have floating channels, since it is recited "wherein (3n-1)th (n is a natural number) channels for each data drive integrated circuit are floating." Since there is no teaching in either of the AAPA, the Shin or the Kim references to provide floating channels in "each" data drive integrated circuit, Applicants respectfully submit that the Examiner's combination of the AAPA, Shin and Kim references fails to arrive at the present invention.

The following comments regarding the failure of the Shin and Kim references to make up for the deficiencies of the AAPA are also provided for the Examiner's consideration. Specifically, the Shin reference does not disclose providing (3n–1)th channels for each data drive integrated circuit, which are floating as required by independent claim 1 of the present invention. In addition, Applicants submit that the Kim reference fails to make up for this deficiency of Shin. Referring to Kim, a shorting bar is connected to the (3n–1)th number data lines; however, the shorting bar is not the equivalent of a floating channel as in the present invention. In Kim, there are shorting bars which are connected to the (3n–2)th number data lines and the (3n)th number data lines in addition to the (3n–1)th number data lines mentioned above. Since all three

shorting bars are used in the LCD display device, **if the shorting bars were actually for forming floating channels, there would be no channels in operation.** The shorting bars of Kim are merely provided to prevent static electricity and are not floating or dummy channels as in the present invention. Referring to column 3, line 57 through column 4 line 23 of Kim, the shorting bars 4-8 are provided to divide the data lines into three segments in order to operate a cell independently for each of the R, G and B colors. Therefore the accuracy of the cell tests and measurements are improved during testing and measuring of the cell. In view of this, Kim does not disclose floating channels, but discloses merely to control the order of the data lines. Accordingly, the combination of references relied on by the Examiner fails to teach or suggest providing (3n-1)th channels for each data drive integrated circuit floating as in the present invention.

With regard to independent claim 5, Applicants respectfully submit that the Examiner's rejection is improper for the same reasons mentioned above with regard to independent claim 1. Specifically, none of the references relied on by the Examiner disclose that each of the drive integrated circuits have floating channels as required by independent claim 5. As mentioned above, the AAPA only includes two drive integrated circuits with floating channels, and Shin and Kim do not disclose any floating channels. Accordingly, the Examiner's rejection of claim 5 is also improper and should be withdrawn.

In view of the above remarks, Applicants respectfully submit that claims 1-5 clearly define the present invention over the references relied on by the Examiner. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103 are respectfully requested.

Additional Claims

Additional claims 6-8 have also been added for the Examiner's consideration. Applicants respectfully submit that additional claims 6-8 are allowable due to their dependence on allowable independent claim 5, as well as due to the additional limitations recited in these claims.

Favorable consideration and allowance of additional claims 35-59 are respectfully requested.

CONCLUSION

Since the remaining references cited by the Examiner have not been utilized to reject the claims, but merely to show the state-of-the-art, no further comments are deemed necessary with respect thereto.

All the stated grounds of rejection have been properly traversed and/or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently pending rejections and that they be withdrawn.

It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

Attached hereto is a marked-up version of the changes made to the application by this Amendment.

In the event there are any matters remaining in this application, the Examiner is invited to contact the undersigned at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Version with Markings to Show Changes Made

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE ABSTRACT OF THE DISCLOSURE

The Abstract of the Disclosure has been amended as follows:

[The present invention discloses a] A quad type liquid crystal display device[, comprising:] includes a liquid crystal panel having gate and data lines which define sub-pixel regions[; gate]. Gate driving integrated circuits for driving the gate lines[; and a] are provided. A plurality of data drive integrated circuits are arranged on one side of the liquid crystal panel[, each]. Each of the data drive integrated [circuit having] circuits have "m" (m is a natural number) number of channels, wherein (3n-1)th (n is a natural number) channels for each data drive integrated circuit are floating.

[The invention can be applied to 1024 by 1024 liquid crystal panels to achieve a diverse inversion driving method to increase application range of the panel.]

IN THE SPECIFICATION

The following paragraph has been added immediately after line 5, page 6:

Further scope of applicability of the present invention will become apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

IN THE CLAIMS

Claims 6-8 have been added.

The claims have been amended as follows:

1. (AMENDED) A quad type liquid crystal display device, comprising:

a liquid crystal panel having gate and data lines which define sub-pixel regions;

gate driving integrated circuits for driving the gate lines; and

a plurality of data drive integrated circuits arranged on one side of the liquid crystal panel, each of the data drive integrated [circuit] circuits having "m" (m is a natural number) number of channels,

wherein (3n-1)th (n is a natural number) channels for each data drive integrated circuit are floating.

5. (AMENDED) A liquid crystal display panel;

a plurality of drive integrated circuits for driving the panel, each of said plurality of drive integrated circuits having "m" (m is a natural number) number of channels and "n" ([n<m,] n is a natural number) number of floating channels;

a plurality of films for connecting the drive integrated circuits, each film having (m-n) number of lines, wherein n<m.